

The Pileup

DXing on Mars

By Marc Tarplee, N4UFP

With all the recent interest in Mars, it is natural for amateurs to speculate about the DX possibilities on the Red Planet. Although Mars has a day similar in length to Earth's and a similar axial tilt that creates four seasons, it is strikingly different from Earth in other ways, resulting in different RF propagation around the planet.

Like Earth, Mars has an ionosphere. Measurements made by Russian and American space probes indicate that during a sunspot minimum, the Martian ionosphere has the properties shown in the table below. The structure of Mars' ionosphere is relatively simple. There is one daytime layer and there are two nighttime layers. This is quite different from Earth, which has 4 layers

	Daytime Ionosphere	Nighttime Ionosphere
Height	145 km (85 miles)	130 km (80 miles) 200 km (125 miles)
Electron Density	10^5 per cc	5×10^3 per cc 2×10^3 per cc
Critical Frequency	~ 3 MHz	~ 600 KHz ~ 400 KHz

ers (D, E, F1, F2) during the day and one after dark.

The next table compares the maximum useable frequencies on Earth and Mars:

Earth's MUF		Martian MUF	
Daytime	Nighttime	Daytime	Nighttime
E ~5 MHz		8 - 12 MHz	1 - 1.5 MHz
F1 ~10 MHz	F 3-14 MHz		1.4 - 2 MHz
F2 15 - 40 MHz			

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CDXA PacketCluster & Other Communication Systems		
W4DXA (11 mi. NE of Mooresville)	144.93 MHz (1200 bits/second)	441.00 MHz (9600 bits/second)
K4MD Charlotte, NC	144.91 MHz (1200 bits/second)	441.075 MHz (9600 bits/second)
Digipeater near Wingate, NC	144.91 MHz (DXWIN)	
CDXA Repeater 147.18 MHz (+600)		W4DXA, Near Fort Mill, SC
World Wide Web Homepage		www.cdxax.org
Wednesday Luncheon (11:30 AM)		Shoney's, 355 Woodlawn Road, Charlotte, NC (704-525-4395)

If amateur frequencies were allocated on Mars, as they are on Earth, only the 160, 80, 40 and 30-meter bands could be used for long-haul communications. Since there is no D-layer on Mars that absorbs lower frequencies, all bands could be used during daylight hours. After dark 160m would be only reliable band for DX. The 20-meter band on Mars would act much like 6m on Earth; during periods of intense solar activity there could be DX openings on 20 during the Martian day.

Mars' axis, like Earth's, is tilted with respect to the plane of the solar system and this creates seasonal variations in RF propagation. Mars' orbit is more also elliptical than Earth's and these two effects impact each hemisphere differently. During the northern hemisphere winter, solar irradiation is 40% higher than it is during the northern hemisphere summer, which causes tremendous seasonal change in MUF. However, in the southern hemisphere, MUF's would be relatively constant throughout the year.

An amateur on Mars would first notice that the noise floor was lower. There is no lightning on Mars to create interference on the lower HF and MF bands. However, in spite of the low noise floor, DX would still be challenging because:

- a) An ionospheric hop on Mars is only about 1200 miles long. To reach the antipode requires 6 hops on Mars versus 5 on Earth.
- b) All paths are over dry (very, very dry) land. Reflection losses are much higher on land than on salt water.

Mars-wide communications would be possible on 30m and 40m during the daytime. Good HF communications

would even be possible into the polar regions, as Mars has no significant auroral zones.

Amateurs on Mars may experience a form of propagation unknown, or at least relatively rare on Earth: ionospheric trapping. A station on the daylight side of the terminator could launch an LF signal towards the night side of the planet. If the RF is launched at the proper angle, it encounters the upper nighttime layer first and becomes trapped between the upper and lower ionospheric layers. As the signal travels across the night side of Mars, it will return to the ground if the lower layer's MUF drops below the signal frequency. In some cases, the signal could be ducted to the other terminator with relatively low loss.

Mars does not possess a planetary magnetic field, which leaves the ionosphere exposed to the solar wind. Solar flares would have a powerful effect on Martian DX. Charged particles emanated by flares would interact directly with the Martian ionosphere, making DX contacts possible on the upper HF and VHF bands.

It is unlikely that any one will get the chance to operate on Mars any time soon, but it is still interesting to think about propagation and DX on other worlds. If nothing else, it gives one a greater appreciation for the wide variety of propagation modes that exist right here at home.

PacketCluster Status now on Website

Our webmaster Wayne, WB4BXW, has provided us a new feature. If you click on "Status" in the Packet Cluster button shown at the top of the home page, you will see the status *AS JOE (K4MD) AND I KNOW IT* for our various systems. Whenever Joe or I become aware of a problem that affects our Packet Cluster, we will post that fact on our web site with any appropriate notes.

If you see any cluster failures or problems that are not being reported in the status window, let Joe or I know so we can look into the problem and update the status window.

I would suggest you do not report problems unless you find they exist for at least 30 minutes in the event they are merely transient problems. Our contact information is on the website under "Officers" and also can be found in the Roster on the same website.

Thanks and 73, Paul, W3GQ

The Pileup

Official Newsletter of the Carolina DX Association
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Published monthly 10 times per year, excluding the months of June and December.

The purpose of the association is to secure for the members the pleasures and benefits of the association of persons having a common interest in Amateur Radio.

Members of the CDXA shall adhere to "The Amateur's Code" as published from time to time in *The ARRL Handbook for Radio Amateurs*, and shall consist of those valid licensed amateur operators having an interest in promoting amateur radio. Long distance communications (DX) is of special interest to members of the association, but said interest is not a requirement of membership.

Dues are \$30 per year for those using the PacketCluster maintained by the Association, \$15 otherwise, payable each January. Dues are payable by check to the Secretary/Treasurer:

Jim Miller, K4SQR
11600 Hilda Court
Charlotte, NC 28226

Hamfest Banquet Again On Tap

It's Charlotte Hamfest time, and once again we'll be having our annual Hamfest Banquet. This year the banquet will be held Saturday night (March 13) at Rheinland Haus at 2418 Park Boulevard. Festivities will begin at 6:45PM with a cash bar, and dinner orders will be taken at 7:30PM. Choices for dinner include steak, fish, chicken and a German combination platter. Price will be less than \$20 per person including tax, tip, and a non-alcoholic beverage with dinner. Your dinner selection need not be made now, but please let our Vice President, Tom Wright know of your intentions to attend. Tom can be reached at: n4hn@arrl.net or by calling 704-536-9117.

The Rheinland Haus is in a small strip mall across Park Road from the Charlotte Chapter of the American Red Cross building. To help you place the locale, you'll find the Red Cross about ½ mile SW of East Boulevard following along Kenilworth from the Uptown area. At this point Park Road joins Kenilworth from the right. Alternatively, going NNE along Park about 2 miles from Woodlawn Avenue will put you at the same place. Approaching Rheinland Haus from the south, Park Road actually continues as a left turn at a traffic light where (according to Charlotte tradition) the mainline route splits and becomes Scott (northbound) and Kenilworth (southbound). Figure that? In case you're totally confused, maps will be available at the Charlotte Hamfest for those less familiar with Charlotte and environs.

Hamfest Help Needed!!

The Charlotte Hamfest is a great way to introduce potential DXers to our favorite hobby. One way to do this is to ensure we have someone at the CDXA booth to meet and talk with those interested in what we're doing. We need to man the booth during hamfest hours—8:30AM to 5:00PM on Saturday and 8:30AM until 1:00PM on Sunday. The easiest/best way to do this is for CDXA members to take a turn staffing the booth for a two hour block of time sometime during the hamfest.

Vice President Tom Wright, N4HN, will be bringing a signup sheet to the weekly luncheons for you to sign up for your preferences. It really isn't "work" in the usual sense since there are generally lots of DXers around with which to renew acquaintances as well as many inquisitive folks who just want to know more about DXing.

We also will have a great inlaid globe again as a raffle prize that will surely bring folks into the booth. If you don't see Tom, call him to let him know when you can help out. His home phone number is 704-536-9117.

Charlotte Hamfest—One of the Best

March is nearing and it is time to enjoy one of the best hamfests in the southeast. As usual, if you want to move up to that next license level, the WCARS group will be conducting license examinations on Saturday, March 13 starting at 1:00PM.

CDXA will have its booth adjacent to the W4 QSL Bureau and the ARRL booths. It's a great place to drop off your QSL cards for DXCC credit and meet up with your fellow DXers.

Back by popular demand for this year's raffle will be another inlaid stone globe. This globe is a beauty and is a welcome addition to the shack to show visitors where various DXCC entities are and to examine great circle routes.

The usual lineup of good forums will be on tap. You'll recognize many CDXAers as speakers: William Culpepper, Broadcast Engineer, speaks on proper station grounding; Carl Smith, editor of DX Magazine and QRZ DX, reviews "DXing in 2004"; Pat Patterson and Robert Rochelle will speak on Internet Security and website design; and Steve Reichlyn will tell us all about his operation from Israel for CQWW Phone in October 2003. New for this year, Rich Moseson, Editor of CQ, discusses "Ham Radio, Looking Forward"; And don't forget Wayne Mills and Gary Dixon updating us all on DXing and the ARRL.

If you want to learn more about the hamfest go to:

www.w4bfb.org/hamfest.html

Website Offers Comprehensive Calendar

Having a hard time keeping up with events and dates on the "ham" calendar? Well, worry no more. Almost anything you need to know about in the ham's world or the CDXA world is now annotated on the CDXA calendar of events. Merely go to the CDXA website and click on the calendar month for which you need to know "what's happening". Thanks to Ted Goldthorpe and Wayne Setzer for this convenient feature.

The Bright Side of QSLing

By John Scott, K8YC

It is Thursday evening, February 5, 2004 and I've just been seated for dinner when the phone rings. Another telemarketer? I'll get it.

"Hello, this is Mike, KM9D, calling from Australia." Suddenly, THIS call has my attention! "I've been checking over comments forwarded to me by my QSL manager, and he reports receiving a comment on a QSL card that you've not received a response from an earlier QSO I had with you. We're sort of holed up here in Australia waiting out the typhoon season, and I thought I'd take care of a few of these outstanding issues while I have the time."

My mind begins to churn. That KM9D callsign sure sounds familiar. "Are you a sailor with an XYL named Jan (KF4TUG)?"

"Yes, that's me."

"Holy cow", I say as I begin to talk a little faster on Mike's nickel. "I've enjoyed following your trail all over the South Pacific. I think I've worked you and Jan in 5W, ZK2, T31, T21 and 3D2 on both CW and SSB. Your manager is OM2SA as I recall. What's the QSO you're checking about?"

"KM9D/KH8 from American Samoa. But I suspect the QSL in question went directly to my Florida address, and it takes a long time for me to pick up my mail there."

"Gee, Mike", I respond, "I won't make you wait on-line from Australia while my computer boots to check my log. Is there some way I can communicate with you via email after I recheck the QSO data?"

"No reason to do that.", says Mike. "You're in the log for 40m CW, and I'll just send you a card right off."

I respond, "Wow that would be wonderful. Sorry to cause you the trouble to call long distance from Australia. But, I'd really like to thank you and Jan for giving all of us the opportunity to work you from your exotic venues. I sail a small one-design sailboat, and you've allowed my XYL and I to vicariously live your dream in a virtual sense. Please pass along my best to Jan, too."

"No problem, John. We purchased one of those phone cards while here, and it doesn't cost too much to call anywhere in the world. 73 and goodbye." Click!

Dinner can wait. A quick check of DX4WIN shows that I sent my card directly to KM9D's home address before I became aware that "George", OM2SA, was Mike and Jan's very effective QSL manager. Then I went back to the October 1, 2003 issue of QRZ DX to look at the wonderful picture of Mike and Jan under sail on their thirty foot sloop, "Don Henry". If only all QSL experiences could be so wonderful. Want to learn more about Jan and Mike's venture? Take a look at the September/October 2003 issue of DX Magazine published by DX Publishing.

Hats On to You!!

How would you like a "free" hat with the CDXA logo silkscreened on the crown? Here's all you have to do:

- Complete 250 QSOs in the ARRL International DX Phone contest to be held on March 6-7, 2004. Contest details on Page 96 of the December, 2003 issue of QST or on the ARRL website.
- Submit your score to the ARRL on behalf of CDXA.
- Submit your summary sheet to Tom Wright, N4HN.

No overall winner will be declared. You'll be a "winner" if you participate on behalf of CDXA as outlined above. Your score will appear on the CDXA website. That's all there is to it!! See you in the contest.

Drake Corner

Most of you know that Olaf Madsen, KF4TP, loves to restore "boat anchors". As a former Drake equipment owner, I'd never consider them boat anchors. Neither does Olaf. That is why he has a "place of honor" for his Drake gear in a corner of his basement.



Honors Continue to Roll In

By John Scott, K8YC

Several months back in the September issue of The Pileup, I wrote an article about the great number of members in our midst who have worked to within two or three places of being #1 on the Honor Roll of DXing. At the time, I encouraged any who I had missed to step forward for recognition.

I am happy to report that on January 27, I received a note from Royce Goodwin, WA4AFE, in Rock Hill, SC reporting that he is on the Honor Roll for Mixed, Phone, and CW. The official count on his ARRL DXCC Award Credit slip is 334, 332, and 326 for Mixed, Phone, and CW, respectively. If I interpret his credit slip and annotations correctly, it looks like Andaman is the elusive culprit keeping Royce from being #1.

Royce reports, "...Since then (receiving the Award Credit Slip) I have TO4E and ST0F worked (phone) and am awaiting a card from them. A computer DX log checkup shows that I am in their log. I will probably see you at Shoney's soon. At 78 years of age, I don't venture out much in foul weather." Well, Royce, still competing for DXCC and using a computer at 78 makes you a youngster in my book, and nobody goes out in bad weather if they don't have to. Maybe you should stick your thumb out the window, and someone coming to Shoney's will pick you up!

Congratulations, Royce, and we all hope Andaman Island comes on the air sometime real soon.

Duke Power Plans Charlotte-area BPL Test

By John Scott, K8YC

Representatives from Duke Power attended a Mecklenburg Amateur Radio Society meeting on February 3 to discuss Duke's planned tests of Broadband over Power Line (BPL) technology in about six areas of Mecklenburg County.

In attendance from Duke Power were Tim Slay (N4IB) and Dave Masters to outline the upcoming tests. A brief recap of the technology Duke will employ was presented before a question and answer session began. While Duke could not divulge whom they are considering for BPL technology, they did state that the technology will principally produce frequencies in the 2MHz to 21MHz range—with suitable notch filtering to avoid the Amateur

bands. About 500 homes will be involved in the test area and the test will include small businesses and apartment complexes. A field strength measuring device has been procured, and a tower to hold the measuring apparatus will be used to measure field strengths above and below power lines to see if significant sky wave energy is being radiated. Within the test areas, Duke has identified ham operators and appeared anxious to promote involvement and comments from the Amateur community. Duke plans on having a domicile in the test area so it can measure actual data throughput in the presence and absence of potentially interfering signals.

A number of well conceived questions arose from the assembly. Some of the questions seemed to provide Duke representatives with ideas for additional test opportunities in their trials. It was refreshing to know that Duke Power seemed to be listening and aware of much of the concern in both the amateur and commercial sectors regarding BPL. At the meetings conclusion, Tim stated they will surely keep the Amateur Radio community involved in the tests. Stay tuned!!

CDXA Plays a Part in "The Big Project"

By Bill Fisher, W4GRW

Roger Webb is a cub scout leader from Mt Holly. Because he is a ham, he has offered to assist in mentoring the Radio Merit badge sessions. On a recent Monday night here in Charlotte, Paul Trotter and I assisted Roger at the site while Jack Guion (W4JG) and Tom Wright (N4HN) assisted from home with the on-the-air contact part. Roger has another class in Gastonia in February. Paul Trotter, Ron Bailey, Josh Fisher, and I will be assisting there, too. We had 24 scouts at our recent session, and expect more than 30 in Gastonia. It was fun seeing kids turned on by ham radio.

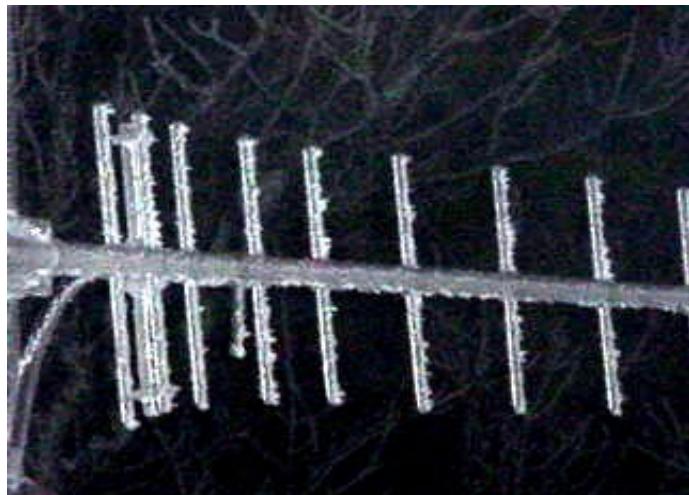


Mountaintopping—The Other Side of the Story (A Pictorial Representation)

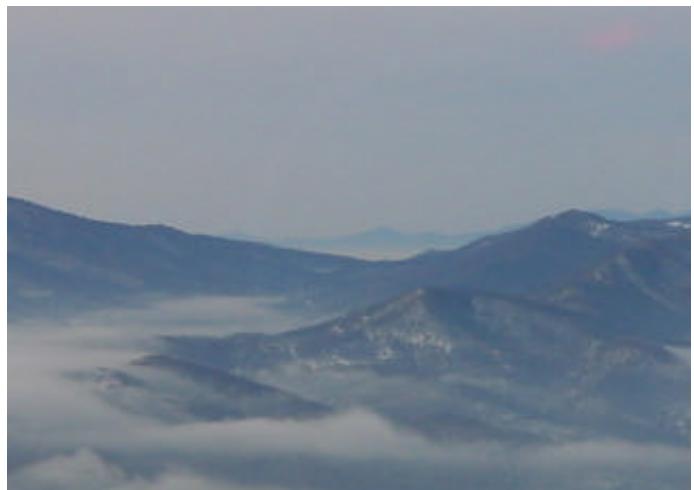
For the past several years, we've followed the AA4ZZ VHF contest team as they trek up to the Blue Ridge Mountains near Boone to participate in the January and June VHF contests. We've heard about the fantastic openings to Europe that come along once in a while, and we've shared the joy when they finished first in their class. Yet there is another side of this mountaintopping story that you should see. Below are a few images from that side.



“Oh, the joys of waking up on a winter’s morning in the mountains!” , relates Ron Bailey



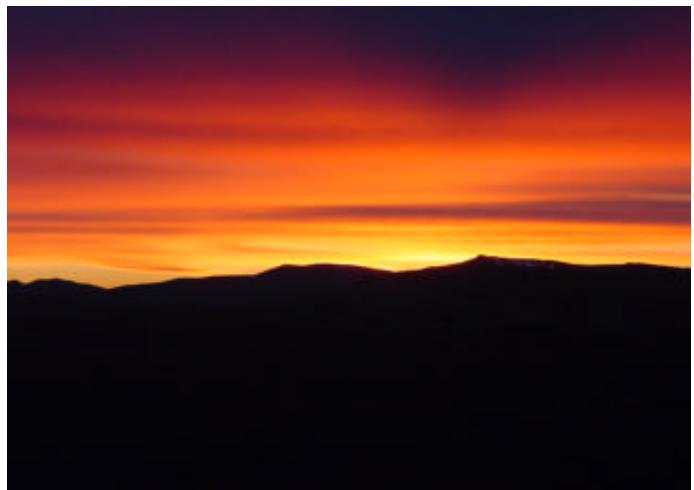
Tower and antenna work is always more invigorating in the January contest than in the June contest. Hams and well diggers have a lot in common in the winter months.



Despite the snow and the cold, there is a real calming effect of overlooking the quiet, cloud-shrouded valleys from above. One’s perspectives get better “aligned” after permitting oneself a moment to take it all in.



.....But, like the Boy Scouts, Paul Trotter is prepared for the frigid temperatures of the evening. Yet, where else can you see a sunset like that shown below?.....



DX Magazine 2003 Most Wanted Survey Results - Overall World-Wide

2003		COUNTRY	2002	2003		COUNTRY	2002
#	PREFIX		#	#	PREFIX		#
1	BS7	SCARBOROUGH	2	51	VP6	DUCIE ISLAND	30
2	VU4	ANDAMAN	1	52	3B6/7	AGALEA / ST BRANDON	84
3	P5	NORTH KOREA	4	53	VP8G	SOUTH GEORGIA	60
4	VU7	LAKSHADWEEP	3	54	YK	SYRIA	66
5	3Y/P	PETER 1	7	55	9U	BURUNDI	57
6	7O	YEMEN	5	56	R1FJ	FRANZ JOSEF	93
7	FR/J	JUAN DE NOVA	6	57	4U1UN	UN Headquarters	64
8	KP1	NAVASSA	9	58	C2	NAURU	76
9	KP5	DESECHEO	8	59	EP	IRAN	45
10	YVØ	AVES ISLAND	10	60	FO/M	MARQUESAS	54
11	3Y/B	BOUVET	16	61	5A	LIBYA	95
12	ZS8	MARION ISLAND	15	62	S2	BANGLADESH	50
13	FT8X	KERGUELEN	11	63	YI	IRAQ	44
14	FR/G	GLORIOSO	13	64	HV	VATICAN	79
15	SV/A	MT ATHOS	18	65	CYØ	SABLE ISLAND	25
16	VKØ/H	HEARD ISLAND	17	66	YA	AFGHANISTAN	40
17	FT8W	CROZET	14	67	ZK2	NIUE	75
18	3CØ	ANNOBON	21	68	FO/A	AUSTRAL	62
19	KH7K	KURE	12	69	TT	CHAD	47
20	ZL8	KERMADEC ISLAND	23	70	5T	MAURITANIA	91
21	FT8Z	AMSTERDAM	22	71	VK9C	COCOS KEELING	67
22	XF4	REVILLA GIGEDO	29	72	VK9M	MELLISH REEF	77
23	1AØ	SOVER.MIL.ORDER-MALTA	31	73	XZ	MYANMAR	61
24	VP8O	SOUTH ORKNEY	20	74	A5	BHUTAN	90
25	PYØS	ST PETER & ST PAUL	34	75	3B9	RODRIGUEZ	81
26	VP8S	SOUTH SANDWICH	28	76	ZD9	TRISTAN DE CUNHA	73
27	T33	BANABA	26	77	A9	BAHRAIN	70
28	ZK3	TOKELAU	37	78	E3	ERITREA	88
29	KH5	PALMYRA	39	79	J2	DJIBOUTI	80
30	FK/C	CHESTERFIELD	27	80	ZK1/N	NORTH COOK	-
31	T5	SOMALIA	35	81	T32	EASTERN KIRIBATI	-
32	FR/T	TROMELIN	46	82	T3Ø	WESTERN KIRIBATI	98
33	E4	PALESTINE	41	83	V8	BRUNEI	-
34	ZL9	AUCKLAND & CAMPBELL	48	84	9N	NEPAL	87
35	JD1/M	MINAMI TORISHIMA	32	85	T2	TUVALU	86
36	3C	EQUATORIAL GUINEA	33	86	FW	WALLIS & FUTANA	-
37	KH9	WAKE	24	87	4W	TIMOR LESTE	68
38	FO/C	CLIPPERTON	74	88	CEØX	SAN FELIX	-
39	TJ	CAMEROONS	56	89	VK9L	LORD HOWE	-
40	T31	CENTRAL KIRIBATI	38	90	KH3	JOHNSTON	51
41	VKØ/M	MACQUARIE	42	91	SØ	WESTERN SAHARA	36
42	HKØ/M	MALPELO	58	92	CY9	ST PAUL ISLAND	96
43	VK9W	WILLIS ISLAND	43	93	H4Ø	TEMOTU	58
44	9X	RWANDA	55	94	TY	BENIN	65
45	3D2/C	CONWAY REEF	49	95	XU	CAMBODIA	89
46	BV9P	PRATAS	52	96	3D2/R	ROTUMA	94
47	1S	SPRATLY	78	97	5V	TOGO	-
48	KH5K	KINGMAN REEF	53	98	FH	MAYOTTE	-
49	TN	CONGO	63	99	JD1/O	OGASAWARA	85
50	KH4	MIDWAY	59	100	VK9X	CHRISTMAS ISLAND	69

The Back Page

Will we see you at the **Charlotte Hamfest**? Yep, it's that time of the year where we get to have an eyeball QSO with all CDXA members. Details inside on Page 3. March 13 and 14 are the dates to set aside. If you're coming to the Charlotte Hamfest, why not come to the **Hamfest Banquet** on Saturday night. A little German food is in the offing this year at the Rheinland Haus. Don't like German food? That's okay because there is a traditional menu, too. Be sure to let Tom Wright know if you're coming. Details inside on Page 3.

Coming to the Charlotte Hamfest? If you don't have the whole day scheduled, please volunteer an hour or two of your time to **man the CDXA booth** to answer questions about DXing from the curious. It's also a great way to meet CDXAers drifting through the Hamfest, too. Tom Wright has a signup sheet. See details inside on Page 3.

Last chance to **pay your dues** is now! If you're one of those who insist on waiting for the Charlotte Hamfest and paying in person, then make sure payment is via check made out to The Carolina DX Association. We just can't ask our treasurer to carry around a wad of cash at the hamfest, and your cancelled check will be your receipt. If you're not coming to the hamfest, you can remit directly to K4SQR at the address shown below. "Card carrying" CDXA members all earn a nice bumper decal to show their affiliation with the best DX Club in the Carolinas.

Upcoming Contests:

Date(s)	Event	Comments
Feb. 14-15	CQ WPX (RTTY)	
Feb. 21-22	ARRL Intl DX (CW)	QST, December 2003, Page 96
Feb. 28-29	CQWW 160m (Phone)	
Feb. 29-Mar. 1	North Carolina QSO Party	
March 6-7	ARRL Intl DX (Phone)	QST, 12/03 (See Page 4, inside for PRIZES for the Phone Contest)

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First Class Mail

See something wrong with your address label? Notify K4SQR at once, please.